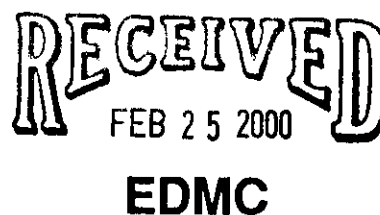


## ACTION MEMORANDUM

## SITE NAME AND LOCATION

U.S. Department of Energy  
Hanford 300 Area National Priorities List (NPL)  
331-A Virology Laboratory Building  
Hanford Site  
Benton County, Washington



## I. STATEMENT OF BASIS AND PURPOSE

The purpose of this Action Memorandum is to document approval of the proposed non-time critical removal action described herein for the 331-A Virology Laboratory Building (331-A building), U.S. Department of Energy's (DOE) 300 Area, Hanford Site, Benton County, Washington.

This removal action's objective is to reduce the risks to the public's human health, the environment, and site workers by removing the above-ground structure (i.e., walls and roof) of the 331-A building. The above-ground structure has been previously decontaminated to the extent feasible but remains contaminated with low levels of radioactive fission products and plutonium. This action does not include removal of the floor slab or any potentially contaminated underground structures or soils associated with the building.

This Action Memorandum has been developed in accordance with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), as amended by the *Superfund Amendments and Reauthorization Act of 1986*, and to the extent practicable, the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP). Specifically, this action is designed to conform with the requirements of the U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA), "Policy on Decommissioning Department of Energy Facilities Under CERCLA" and the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement). This decision is based on the Administrative Record for the site.

A public comment period was held from October 27, 1999, through November 26, 1999, on the DOE report entitled *Engineering Evaluation/Cost Analysis for the 331-A Virology Laboratory Building*, (DOE/RL-99-64, Rev. 0). The parties received four comments during the public comment period. None of the comments were opposed to the preferred alternative although at least one comment would prefer removal of potentially contaminated material beneath the floor slab of the 331-A Virology Laboratory Building. Responses to comments are included in Appendix A of this Action Memorandum and can be found in the Administrative Record for this site.

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## **II. BACKGROUND AND FACILITY DESCRIPTION**

### **A. Background**

The Hanford Site is a federal facility managed by the U.S. Department of Energy (DOE). It was established in 1943 to produce plutonium for nuclear weapons using reactors and chemical processing. The Hanford Site occupies approximately 1,456 km<sup>2</sup> (560 mi<sup>2</sup>) along the Columbia River in Benton County, which is in southeastern Washington State. The Hanford Site is situated north and west of the cities of Richland, Kennewick, and Pasco, an area commonly known as the Tri-Cities (Figure 1).

In November 1989, the 100, 200, 300, and 1100 Areas of the Hanford Site were placed on the NPL. Specifically, the 331-A building identified in this Action Memorandum resides in the 300 Area NPL, adjacent to the Columbia River (Figure 2). The 300 Area includes many liquid and solid waste disposal sites used to support past operations. To organize remediation efforts under CERCLA, these sites were subdivided into operable units (OUs) consisting of waste sites that were related both geographically and by type. There are two source OUs that contain all of the liquid and solid waste disposal sites that have been identified in the 300 Area (i.e., 300-FF-1 and 300-FF-2). The 300 Area groundwater is addressed as part of the 300-FF-5 OU.

Waste sites in the 300-FF-1 OU have already been evaluated and are being remediated in accordance with a CERCLA Record of Decision (ROD) (EPA 1996). Waste sites in the 300-FF-2 OU are currently undergoing evaluation; a ROD authorizing remediation of the 300-FF-2 waste sites is anticipated in the year 2000. The 300-FF-2 ROD will be designed to address not only known waste sites in the 300 Area but also any new waste sites identified in the future.

In general, buildings in the 300 Area are not identified as waste sites or are not included in the 300-FF-1 or 300-FF-2 OUs. However, in accordance with DOE requirements for the decontamination and decommissioning program, buildings that are contaminated and that pose a threat to human health and the environment may be addressed as CERCLA removal actions. Any surface or subsurface contamination remaining at the building after this removal action may be addressed as a newly discovered waste site in accordance with the 300-FF-2 ROD. The U.S. Environmental Protection Agency (EPA) is the lead regulatory agency for this facility and the Hanford 300 Area NPL Site.

### **B. Facility Description**

The 331-A Virology Laboratory Building is a T-shaped, one-story concrete block building with an almost flat wood-frame roof. The building rests on a concrete slab foundation. The facility began operations in 1972 for the purpose of animal, bacterial, and viral research on the effects of exposure to radiation. The building contained laboratories of various sizes, including a former pen area for laboratory animals. The floor plan of the building is shown in Figure 3.

Separate ventilation supply systems were provided for the laboratory areas (air conditioning) and the swine barn (evaporative cooler). Exhaust ventilation was provided through a central high-efficiency particulate air-filtered system that was zoned to prevent the spread of viral contamination from the small laboratory area.

Radiologically exposed animals (by ingestion or injection) were generally held in other areas of the 331 Facility outside of the 331-A building. Their feces were monitored until there was no evidence of radioactivity, and then the animals were returned to their pens. Thus, there would be little or no radioactivity expected in the animal wastes in the 331-A building. Animal wastes were washed into trenches that were routed to a discharge trench near the Columbia River. This later changed to incorporate a waste treatment operation at the 331-D Building, and subsequently the wastes were routed to the 300 Area sanitary sewer system. Preparation of radioactive sources for animal exposure occurred in a liquid transfer hood in Room 9 of the building.

An incinerator for disposal of animal carcasses was located at the 331-A building, on the northeast side of the building located on the loading dock. Carcasses were surveyed for radioactivity and only released for incineration if no radioactivity was noted in the survey. Thus, there was no radioactivity expected in the incinerator, and the off-gas was not sampled. The incinerator had an off-gas scrubber, and the scrubber solution was checked periodically for proper pH.

An incident occurred in 1975 in a metal storage shed located outside of the 331-A building. Radioactive contamination was released when a waste container stored in the shed leaked. The leak spread plutonium-238 alpha contamination onto the outside concrete of the 331-A building. The contaminated concrete was removed by chipping and was then replaced with new concrete.

In the mid-1990s, the interior of the building was deactivated and the contents were removed in preparation for eventual demolition. Nearly all of the piping and conduit and all of the ductwork were removed at that time. The concrete floor was extensively scabbled<sup>1</sup> to decontaminate the slab. Cinder block from the walls, a small amount of structural steel (rebar), wood from the roof, and built-up asphalt roofing material remain.

There are no known waste sites requiring investigation and remediation listed in Appendix C of the Tri-Party Agreement in or under the 331-A building or adjacent to the building. However, waste sites could potentially exist in the general vicinity of the building. These waste sites may be addressed by the 300-FF-2 ROD.

### **III. THREAT TO PUBLIC HEALTH/WELFARE/ENVIRONMENT**

The 331-A building addressed in this Action Memorandum is known to be contaminated with hazardous substances, primarily radionuclides. For occasional entry of workers into the 331-A

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<sup>1</sup> Scabbling is a mechanical process used to remove concrete surfaces. Scabbling equipment typically incorporates piston heads that strike (i.e., chip) a concrete surface. Related processes are shot or grit blasting and grinding.

building, there is minimal risk. However a worker occupying the building full-time (i.e., 40 hours per week, 50 weeks per year) could receive an external exposure exceeding 100 millirem per year. Although this level of exposure would be within allowable exposure levels for radiological workers, workers would require specific radiological worker training and monitoring to occupy the building full-time in its present condition. This level of exposure would not be acceptable for general workers. In addition, both radiological and general workers are subject to the potential for inhaling or ingesting radiological contaminants if the building structure is disturbed (e.g., through renovation). The building would present an unacceptable risk to the general worker and, thus, could not be released for general industrial use in its present condition.

The current threat of a release of contaminants from the 331-A building is relatively low when compared to other major decontamination and decommissioning removal actions, such as reactor interim safe storage or the 233-S Decommissioning Project. However, as the building continues to age, the threat of a potential release increases. In addition, under DOE's future land-use planning, the 300 Area is intended to be developed for general industrial purposes. Exposure to the interior surfaces of the building poses a threat to general industrial workers and any future potential users of the 331-A building.

In addition, the 331-A building is located in a part of the Hanford Site adjacent to the Columbia River, which is accessible to the public as well as several ecological receptors. Should this facility deteriorate, hazardous substances such as plutonium could be released and potentially expose not only on-site workers, but also off-site receptors.

The external radiation, inhalation, and ingestion risks associated with the building contamination under this future use scenario and the potential for off-site exposures justifies a non-time-critical removal action.

#### **IV. ENDANGERMENT DETERMINATION**

In accordance with the DOE and EPA joint "Policy on Decommissioning Department of Energy Facilities Under CERCLA" and Executive Order 12580, "Superfund Implementation," DOE as lead agency may determine that removal actions are appropriate to deal with releases or the potential threat of release from buildings or structures. In the case of the 331-A building, DOE has determined that there is a threat of release of hazardous substances, principally radionuclides, that justifies the use of removal action authority CERCLA Section 104(a).

#### **V. PROPOSED ACTIONS AND ESTIMATED COSTS**

An EE/CA was prepared in order to develop removal action alternatives for the 331-A building. Future use plans call for reusing this site for general industrial purposes in support of another nearby industrial facility. Therefore, removal action alternatives (e.g., institutional controls and containment), which would leave the superstructure in place, were not developed.

Decontamination of remaining contaminated structures within the building has already occurred to the extent feasible. There are no unique features of the building that would suggest the need for innovative demolition methods. Therefore, no demolition alternatives other than the use of standard demolition techniques were identified. The only potential alternatives available for consideration were alternative locations for disposal of contaminated debris generated by the removal action.

The majority of the contaminated debris is expected to be designated as low-level waste (LLW). Viable disposal options for LLW at the Hanford Site are the Environmental Restoration Disposal Facility (ERDF) and the Low-Level Burial Grounds (LLBG). The ERDF is a landfill located in the 200 West Area of the Hanford Site that was specifically designed and constructed as an isolation structure for long-term disposal of Hanford Site remediation wastes. Construction and operation of the ERDF were authorized via a separate CERCLA ROD (EPA et al. 1995), and disposal of waste generated during demolition activities was authorized by the ERDF explanation of significant differences (ESD) (EPA et al. 1996). The ERDF is a highly engineered structure designed to meet *Resource Conservation and Recovery Act of 1976* (RCRA) minimum technological requirements for landfills, including standards for a double liner, a leachate collection system, leak detection, and final cover. Disposal of waste at the ERDF is estimated to cost \$141 per cubic meter (\$110 per cubic yard), which includes transportation costs. The LLBG are unlined landfills located in the 200 East and 200 West Areas of the Hanford Site used for disposal of a variety of Hanford radioactive wastes. The LLBG are unlined with no leachate collection; they will be provided with a final cover. Disposal of low-level radioactive waste at the LLBG is estimated to cost \$497 per cubic meter (\$378 per cubic yard) excluding transportation costs. The ERDF and the LLBG disposal options are technically similar in that they both involve land disposal of waste. However, the ERDF provides a more appropriate level of protection at a lower cost. Therefore, only ERDF disposal is discussed in the alternatives analysis.

Based on the above consideration, only two removal action alternatives were evaluated. These two alternatives are briefly discussed below.

#### **1. No Action Alternative**

Under Alternative One, the 331-A building would be monitored and maintained in perpetuity until the final disposition of the Life Sciences Laboratory complex (which the 331-A building is a part of) is made. The 331-A Building would not be demolished and radioactively contaminated debris would not be generated. In addition, the building foundation would not be available for industrial reuse. No other specific controls would be established, and no action would be taken to address the hazards associated with the building. Access by the general public to the building would be prevented through ongoing Hanford Site access restrictions. Because the building is contaminated, there would continue to be a potential that a release could expose site workers or members of the surrounding community to hazardous substances over time as the building structure deteriorates.

The cost of this alternative would be negligible. Surveillance and maintenance would continue on the building, with an estimated annual cost of \$2,000 to \$3,000, until the building would be demolished.

## **2. Demolition, Removal, and Disposal**

Under this alternative the walls and roof of the 331-A building would be demolished, removed, and the waste would be disposed at the ERDF. Demolition of the building would follow standard practices using heavy equipment. Work would progress from the outside in, and generally from north to south, using caution not to damage nearby structures or utilities. Water would be used to control dust during demolition. After the building has been brought completely to the ground, a front-end loader and the excavator would be used to load the debris into disposal transport trucks. The concrete slab would be scraped clean of loose debris and all protuberances that may act as tripping hazards would be removed. The concrete slab would remain in place, as would soil underlying the slab.

The ERDF ESD document (EPA et al. 1996) modified the ERDF ROD (EPA et al. 1995) to clarify that any environmental cleanup waste generated as a result of CERCLA or RCRA cleanup actions, including decontamination and decommissioning wastes from the Hanford Site, can be disposed at the ERDF provided that the waste meets ERDF waste acceptance criteria and that appropriate CERCLA decision documents are in place. The waste to be generated during the 331-A building removal action falls within the definition of waste eligible for disposal at the ERDF established in the ROD and ESD.

Building demolition would generate approximately 102 cubic meters (133 cubic yards) of debris made up primarily of two waste streams: concrete from the walls and wood from the roof. Management of these waste streams would be described in a waste control plan that would be approved by EPA prior to waste generation as part of the 331-A Removal Action Workplan. In general, the waste streams would be sampled in accordance with the data quality objectives identified for ERDF disposal (BHI 1999) and a sampling and analysis plan would be prepared prior to demolition. For the concrete waste stream, sampling would address both radiological contaminants and potential heavy metals on painted concrete surfaces. For the wood waste stream, sampling would only address radiological contaminants. Based on the analytical results from sampling, an appropriate waste designation (e.g., solid or radioactive) would be assigned to the waste streams and a waste profile would be developed. This waste profile would be evaluated to ensure that all of the ERDF waste acceptance criteria are met.

Prior to transport, the waste may be treated as necessary to minimize volumes (e.g., by crushing, sizing, and sorting) or to meet the ERDF waste acceptance criteria. Waste materials would be recycled, reused, or reclaimed when feasible.

The total estimated cost of this alternative is \$46,190.

### 3. Applicable, or Relevant and Appropriate Requirements

This removal action shall, to the extent practicable considering the exigencies of the situation, attain applicable, or relevant and appropriate requirements (ARARs) under federal and state environmental laws. The selected alternative shall comply with the federal and state ARARs identified to the extent practicable. The ARARs identified for this removal action are:

- *Hazardous Waste Management Act of 1976* (70.105 RCW), “Dangerous Waste Regulations” (WAC 173-303). This RCRA-authorized state program is applicable to the identification and generation of dangerous waste (which includes all federally regulated hazardous waste under RCRA) and storage, transportation, treatment, and disposal of the wastes generated during the interim removal action that designate as dangerous waste.
- “RCRA Land Disposal Restrictions” (40 CFR 268). Applicable for treatment and disposal of wastes designated as dangerous wastes.
- *Solid Waste Management Act* (70.95 RCW), “Minimum Functional Standards for Solid Waste Handling” (WAC 173-304). Applicable for management of solid wastes generated during the interim removal action.
- *Toxic Substances Control Act* (15 U.S.C. 2601, et seq.) implemented via 40 CFR 761. Applicable to the management and disposal of remediation waste containing regulated concentrations of polychlorinated biphenyls (PCBs), including specific requirements for PCB remediation waste.
- “Licensing Requirements for Land Disposal of Radioactive Wastes” (10 CFR 61). Establishes substantive requirements for management and disposal of radioactive waste at U.S. Nuclear Regulatory Commission-licensed facilities that are relevant and appropriate for wastes generated by the interim removal action.
- *Clean Air Act* (42 U.S.C. 7401, et seq.) and “National Emissions Standards for Hazardous Air Pollutants” (40 CFR 61 Subparts H and M). Applicable to removal activities that will result in airborne emissions of hazardous air pollutants, including prohibitions on radionuclide emissions that would result in an effective offsite dose equivalent of 10 mrem/yr and visible emissions from asbestos-handling activities.
- “Emission Limits for Radionuclides” (WAC 173-480). Applicable to removal activities that will result in air emissions of radionuclides from specific sources,
- *Nuclear Energy and Radiation Act* (70.98 RCW) and “Radiation Protection – Air Emissions” (WAC 246-247). Applicable to removal activities that will result in airborne emissions of radionuclides, including requirement for best available radionuclide control technology (BARCT).

- *National Archeological and Historical Preservation Act of 1974* (26 U.S.C. 469) implemented via 36 CFR 65. Applicable when removal activities may cause irreparable harm, loss, or destruction of significant artifacts in the 300-N Area.
- *Archeological Resources Protection Act of 1979* (16 U.S.C. 417) implemented via 43 CFR 7. Applicable when removal activities may cause possible harm or destruction of sites in the 300-N Area having religious or cultural significance.
- *National Historic Preservation Act of 1966* (16 U.S.C. 470, et. seq.) implemented via 36 CFR 800. Applicable to removal activities that could impact historic or potentially historic properties.
- *Endangered Species Act of 1973* (16 U.S.C. 1531, et. seq.) implemented via 50 CFR 17, 22, 200, 225, 226, 227, 402, and 424. Applicable to removal activities that could impact threatened or endangered species or critical habitat upon which endangered or threatened species depend.

**Other Criteria, Advisories, or Guidance to be Considered for this Interim Removal Action (TBCs)**

- EPA Memorandum, *Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination* (Office of Solid Waste and Environmental Remediation [OSWER] Directive No. 9200.4-18). Provides EPA guidance that cleanup of radionuclides in soils to 15 mrem/yr above natural background is generally considered protective under CERCLA.
- *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00319, Rev. 3. Delineates primary requirements including regulatory requirements, specific isotopic constituents and contamination levels, the dangerous/hazardous constituents and concentrations, and the physical/chemical waste characteristics that are acceptable for disposal of wastes at the ERDF.

#### **4. Project Schedule**

This removal action will begin upon approval of this Action Memorandum and the Removal Action Workplan and completed by September 30, 2000. This Action Memorandum requires DOE to submit the following reports/documents to EPA for review and approval:

- Removal Action Workplan that shall outline how DOE will comply with the ARARs. The Workplan will include a Waste Management Plan and this Workplan must be approved prior to initiating any removal work.
- Sampling and Analysis Plan for characterization and waste disposal. (This plan has already been approved by EPA.)



- Treatment Plans if treatment is necessary prior to waste disposal in ERDF.

#### **VI. EXPECTED CHANGE SHOULD ACTION BE DELAYED OR NOT TAKEN**

The expected change to the 331-A building should action be delayed or no action taken would that the building would remain as it is today. Because the building is contaminated, there would continue to be a potential that a release could expose site workers or members of the surrounding community to hazardous substances over time as the building structure deteriorates. Additionally, future use of the building would not be possible, nor would the site be available for reuse for industrial purposes in support of another nearby industrial facility.

#### **VII. OUTSTANDING POLICY ISSUES**

None.

#### **VIII. RECOMMENDATION**

EPA recommends Alternative 2, "Demolition, Removal, and Disposal" as the preferred alternative to be implemented for 331-A.

Signature sheet for the DOE Hanford Action Memorandum covering the 331-A Virology Laboratory Building. This action is between the United States Department of Energy and the United States Environmental Protection Agency with concurrence by the Washington State Department of Ecology.

A handwritten signature in black ink, appearing to read 'K. Klein', written over a horizontal line.

Keith A. Klein  
Manager, Richland Operations Office  
United States Department of Energy

2/15/00  
Date

Signature sheet for the DOE Hanford Action Memorandum covering the 331-A Virology Laboratory Building. This action is between the United States Department of Energy and the United States Environmental Protection Agency with concurrence by the Washington State Department of Ecology.

A handwritten signature in black ink, appearing to read "M. Gearheard", written over a horizontal line.

Michael F. Gearheard

Director, Environmental Cleanup Office, Region 10  
United States Environmental Protection Agency

2-3-00  
Date

## APPENDIX A



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 Swift Eculevard, Suite 5  
Richland, Washington 99352

January 27, 2000

Calvin A. Rinne .  
Fluor Daniel Hanford  
P.O. Box 1000, MSIN H8-71  
Richland, WA 99352

Dear Mr. Rinne:

The U.S. Environmental Protection Agency (EPA) has thoroughly reviewed the information available about the potential nature and extent of contamination beneath the 331-A Virology Laboratory Building.

At this time, EPA does not believe it is necessary to remove the slab for the purpose of remediation or to evaluate the nature and extent of contamination. Instead, EPA shall require all penetrations through the slab to be sealed to isolate any potential contamination from the building and accessible environment. Sealing these penetrations will also eliminate the potential for moisture to drive any contaminants deeper into the soil column or groundwater.

Thank you for the comment and concerns. If you have any additional concerns, please feel free to call me at 376-9829.

Sincerely,

A handwritten signature in cursive script, reading "Douglas R. Sherwood".

Douglas R. Sherwood  
Hanford Project Manager



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 Swift Boulevard, Suite 5  
Richland, Washington 99352

January 27, 2000

June Robinson  
Pacific Northwest National Laboratory  
P.O. Box 999, MSIN P7-57  
Richland, WA 99352

Dear Ms. Robinson:

The U.S. Environmental Protection Agency (EPA) has thoroughly reviewed the information available about the potential nature and extent of contamination beneath the 331-A Virology Laboratory Building.

At this time, EPA does not believe it is necessary to remove the slab for the purpose of remediation or to evaluate the nature and extent of contamination. Instead, EPA shall require all penetrations through the slab to be sealed to isolate any potential contamination from the building and accessible environment. Sealing these penetrations will also eliminate the potential for moisture to drive any contaminants deeper into the soil column or groundwater.

Thank you for the comment and concerns. If you have any additional concerns, please feel free to call me at 376-9529.

Sincerely,

A handwritten signature in cursive script, reading "Douglas R. Sherwood".

Douglas R. Sherwood  
Hanford Project Manager



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 Swift Boulevard, Suite 5  
Richland, Washington 99352

January 27, 2000

Allan Panitch  
P.O. Box 99387  
Seattle, WA 98199-0387

Dear Mr. Panitch:

Thank you for your support of the preferred alternative for demolition of the 331-A Virology Laboratory Building. We believe this is a prudent step in the cleanup of the 300 Area at Hanford.

Should you have any questions or additional concerns about this project, please feel free to call me at (509) 376-9529. Thanks again.

Sincerely,

A handwritten signature in cursive script, appearing to read "Doug Sherwood".

Douglas R. Sherwood  
Hanford Project Manager



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10 HANFORD PROJECT OFFICE  
712 Swift Boulevard, Suite 5  
Richland, Washington 99352

January 27, 2000

Gordon J. Rogers  
1108 N. Road 36  
Pasco, WA 99301

*Gordon*  
Dear Mr. Rogers:

Thank you for your support of the preferred alternative for the demolition of the 331-A Virology Laboratory. We believe this action is an appropriate part of revitalizing the 300 Area.

Should you have any questions or concerns about this project, please feel free to call me at (509) 376-9529. Thanks again.

Sincerely,

A handwritten signature in cursive script, reading "Douglas R. Sherwood".

Douglas R. Sherwood  
Hanford Project Manager